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A Simple Test to Demonstrate the Implausibility of the Vitreous Traction Hypothesis

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Vitreous traction, proposed to be caused by abusive head trauma, is often used to indicate abuse (1). A simple test, however, is available to anyone with vitreous floaters and reveals this established relationship to be unlikely. While observing one's floaters, a patient can simply look up and down or side to side. The patient will observe marked movement of the floaters. Next, the patient should shake their head up and down, as if gesturing "yes," or side to side, as if gesturing "no." Their floaters will move little if any. When using one's eye muscles, the sclera is moved, and the momentum of the vitreous causes it to lag behind. This differential movement between the sclera and the vitreous can produce traction forces in the interlaying retina. Upon shaking one's head, however, the entire orbit moves. Thus the scleral shell and the vitreous experience identical forces (there is no other source of force in the orbit). Since all the orbital contents have similar densities (mass per unit volume) they all move at similar speeds (Newtons second law(F=MA), thus producing little or no differential movement. There are, therefore, little or no traction forces created. The vitreous traction hypothesis, as proposed by Greenwald et al., regarding production of retinal damage is not likely to be possible and should be reconsidered (2). In fact, Greewald's hypothesis was based on a misreading of a reference to Duke-Elder which states, in reference to the lens, vitreous gel, and retina that, "this adherence , however, is slight and tenuous" (3) while Greewald says firm attachments exist.

DISCLOSURE

Conflicts of Interest: None declared.

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